

CLAIMS

What is claimed is:

1. A method for determining vulnerable plaque in a cardiovascular lumen, comprising:
 - inserting a guide member into the cardiovascular lumen;
 - sensing temperature from a first position along the inserted guide member;
 - sensing temperature from a second position along the inserted guide member, the second position proximal the first position; and
 - determining the vulnerable plaque based on the sensed temperature from the first position and the sensed temperature from the second position.
2. The method of claim 1 wherein the first and second temperature-sensing positions comprise positions of temperature sensors located on the guide member.
3. The method of claim 1 further comprising:
 - identifying placement of the temperature-sensing positions; and
 - determining a location of the vulnerable plaque.
4. The method of claim 3 wherein the temperature-sensing positions are identified with one of an indexed guide member, a radiopaque marker on the guide member, or a radio-frequency coil on the guide member.
5. The method of claim 1 further comprising:
 - measuring flow of fluid within the cardiovascular lumen proximate the temperature-sensing positions.

6. The method of claim 5 wherein the flow measurement uses a flow sensor located on the guide member.

7. The method of claim 5 further comprising:
compensating the sensed temperature from the first position with the flow measurement;
compensating the sensed temperature from the second position with the flow measurement; and
determining the vulnerable plaque based on the difference between the compensated sensed temperatures.

8. The method of claim 1 further comprising:
cooling bodily fluid flowing in the cardiovascular lumen to increase the change between the first position temperature and the second position temperature.

9. The method of claim 8 wherein cooling bodily fluid comprises applying a cold compress on a neck, injecting a cold saline solution into the cardiovascular lumen, or breathing cooled air.

10. The method of claim 1 further comprising:
treating the vulnerable plaque.

11. A system for determining vulnerable plaque in a cardiovascular lumen, comprising:
means for inserting a guide member into the cardiovascular lumen;
means for sensing temperature from a first position along the inserted guide member;
means for sensing temperature from a second position along the inserted guide member, the second position proximal the first position; and

means for determining the vulnerable plaque based on the sensed temperature from the first position and the sensed temperature from the second position.

12. The system of claim 11 further comprising:
 - means for identifying placement of the temperature-sensing positions; and
 - means for determining a location of the vulnerable plaque.
13. The system of claim 11 further comprising:
 - means for measuring flow of fluid within the cardiovascular lumen proximate the temperature-sensing positions.
14. The system of claim 11 further comprising:
 - means for compensating the sensed temperature from the first position with the flow measurement;
 - means for compensating the sensed temperature from the second position with the flow measurement; and
 - means for determining the vulnerable plaque based on the difference between the compensated sensed temperatures.
15. The system of claim 14 further comprising:
 - means for cooling bodily fluid flowing in the cardiovascular lumen to increase the change between the first position temperature and the second position temperature.
16. The system of claim 14 further comprising:
 - means for treating the vulnerable plaque.
17. An apparatus for determining vulnerable plaque in a cardiovascular lumen, comprising:

a guide member;
a first temperature-sensing device operably attached to the guide member;
a second temperature-sensing device spaced apart from the first temperature device and operably attached to the guide member; and
a controller operably communicating with the first and second temperature-sensing devices, wherein the controller determines a change between temperature sensor readings received from the first and second temperature-sensing devices.

18. The apparatus of claim 17 wherein the guide member is a catheter or a guide wire.

19. The apparatus of claim 17 further comprising:
means for determining the location of the first temperature-sensing device and the second temperature-sensing device.

20. The apparatus of claim 17 further comprising:
a flow sensor attached to the guide member proximate the first temperature-sensing device or the second temperature-sensing device, wherein the flow sensor is operably coupled to the controller to compensate the temperature sensor readings.